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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/686,031	10/11/2000	Mikael Isaksson	S1022/8549	5932

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EXAMINER

CHANG, EDITH M

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 01/14/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/686,031

Applicant(s)

ISAKSSON ET AL.

Examiner

Edith M Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words.

It is suggested to rewrite the abstract in one paragraph within the range of 50 to 150 words.

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.

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- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

It is suggested to add "BRIEF DESCRIPTION OF THE DRAWINGS" on the first line of page 4 of the specification, and add "DETAILED DESCRIPTION OF THE INVENTION" on the first line of page 5 of the specification.

Drawings

3. The drawings are objected to because the following informalities: Add the units of the x and y axis of Fig.4 and Fig.5. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claims 1-8, 10-12, and 20-22 are objected to because of the following informalities:

Claim 1, the terms "DMT" and "VDSL" must be spelled out when they first appear in the independent claims.

Claim 7, the term "NEXT" must be spelled out when they first appear in the claim.

Claim 10, the term "DMT" must be spelled out when they first appear in the claim.

Claim 20, the term "DMT" must be spelled out when they first appear in the claim.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, in line 6, the term “estimating the time mis-alignment and power of cross-talk DMT signals” is not clear that it is to estimate the time-alignment of cross-talk DMT signals and estimate the power of cross-talk DMT signals, or to estimate the time mis-alignment and estimate the power of cross-talk DMT signals. It is not clearly what items are estimated.

For estimating the time mis-alignment, add the reference points which the mis-alignment time estimate from, to clearly indicate the invention in the estimating step in the line 6.

In line 9, the step “using auto-correlation on the received signal and a delayed copy of the received signal” is not complete to clearly indicate the invention. Add phrases to support/explain the using of this step for, or change the word “using” to “performing” to be one clear step.

Claims 2-7 are rejected as the dependent claims of the rejected claim 1.

Claim 7, the phrase "for example" (“e.g.”), “or the like” or “such as” renders the claim indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

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Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-10, 13-15, 18-20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sands et al. (US 6134283) in view of Hardcastle et al. (US 6178025 B1).

Regarding **claim 1**, except explicitly specify using the correlation for the power of the signal, Sands et al. discloses a method in the DMT system having at least two VDSL systems, each comprising a pair of modems (FIG.2 two VDSL systems: 202-204-214 and 202-204-218; FIG.3, column 9 lines 45-47, column 11 lines 14-20 where are pairs of modems: 310-LINE-1-214 and 310-LINE-2-218; column 10 lines 20-35 the system is DMT VDSL), it comprises the steps of: estimating the time mis-alignment and power of cross-talk signals (FIG.12, column 17 lines 40-67; 1202 FIG.12 estimating the power of cross-talk signals, 1206 estimating the time mis-alignment); and detecting the signal maxima that determined the frame boundaries (502 FIG.5A/5B, FIG.9 & FIG.10 where the Δe shows the frame boundaries/the frames on x axis). However Hardcastle et al. teaches using auto-correlation on the received signal and a delayed copy of the received signal (Fig.3 & Fig.4). As Sands et al. estimating the power/energy of the received signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the

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received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Regarding **claims 9 & 19**, except explicitly specify means and its method for applying an autocorrelation to the signal, Sands et al. discloses the apparatus and its methods. It comprises:

- a) means and its method for receiving a carrier signal on the transmission channel (FIG.1B, 1102-1106 FIG.11); b) means and its method for generating a power of the signal (1122-1124 FIG.11, 502 FIG.5A); c) means and its method for detecting maxima of the carrier signal (502 FIG.5A) and maxima of a crosstalk signal (1122-1124 FIG.11, 1202 FIG.12); d) means and its method for determining a time misalignment between the carrier signal and the crosstalk signal (1122-1124 FIG.11, column 18 lines 15-25 where the crosstalk is determined in quiet periods of the frame, that is determining a time misalignment between the signal and crosstalk); and e) adjusting a frame timing of the carrier signal based on the time misalignment (1114 FIG.11, 1206 FIG.12, column 18 lines 15-25, lines 38-40, lines 55-60 where are the adjusting techniques). However Hardcastle et al. teaches using auto-correlation on the received signal (Fig.3 & Fig.4). As Sands et al. estimating the power/energy of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

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Regarding claim 14, except explicitly specify applying autocorrelation to the signal, Sands et al. discloses a method comprising acts of: a) using the first VDSL modem (204 FIG.2, column 9 lines 45-47, column 11 lines 15-20, where each line is a modem) of a first modem pair to send a first DMT signal over a first transmission channel (204, 212-1, 214 FIG.2) in a cable (222 FIG.2); b) using the first VDSL modem (204 FIG.2, column 9 lines 45-47, column 11 lines 15-20, where each line is a modem) of a second modem pair to send a second DMT signal over a second transmission channel (204, 212-n, 218 FIG.2) in a cable (222 FIG.2) c) using the second VDSL modem (214 FIG.2) of a first modem pair to receive the first DMT signal, the first DMT signal including crosstalk from the second DMT signal (column 11 lines 20-38 where the 310 is the 204 in FIG.2 the NEXT existing); c) detecting maxima of the carrier signal (502 FIG.5A) and maxima of a crosstalk signal (1202 FIG.12); d) determining a time misalignment between the carrier signal and the crosstalk signal (column 18 lines 15-25 where the crosstalk is determined in quiet periods of the frame, that is determining a time misalignment between the signal and crosstalk); and e) adjusting a frame timing of the carrier signal based on the time misalignment (1206 FIG.12, column 18 lines 20-25, lines 38-40, lines 55-60 where are the adjusting techniques). However Hardcastle et al. teaches using auto-correlation on the received signal (Fig.3 & Fig.4). As Sands et al. estimate the power/energy of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

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Regarding **claim 3**, Sands et al. teaches the time of mis-alignment of the cross-talk signals estimated as the distance between the correlation maximum to the desired signal and other correlation maxima (FIG.9 & FIG.10, where the Δe shows the distance (the frames on x axis) between the correlation to the desired signal and other correlation maxima).

Regarding **claims 4, 13, 18, & 23**, Sands et al. does not explicitly specify the correlation, however Hardcastle et al. teaches the means and its method of amplitude of a correlation (Fig.3 & Fig.4). As Sands et al. estimate the power/energy which is related to the amplitude of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Regarding **claim 5**, Sands et al. discloses the time offset of crosstalk at the Unit-Optical Network Unit (column 9 lines 35-45 where the ONU is the Unit-optical Network Unit, column 18 lines 12-35 where the time offset is estimated), this information will be used to adjust the clock and frame boundaries (column 18 lines 38-50).

Regarding **claim 6**, Sands et al. discloses that if the peak amplitude/energy of the cross-talk signal is low comparing a threshold, the transceiver can choose not to do the synchronization (1204-NO-END FIG.12).

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Regarding **claim 7**, Sands et al. discloses the method for several other applications (column 4 lines 10-30, NEXT and FEXT).

Regarding **claim 8**, Sands et al. discloses every modem in a system uses this method result in that all modems that causes interference in each other's receivers will become aligned to the same frame timing (column 6 line 1-10).

Regarding **claims 10, 15 & 20**, Sands et al. discloses the carrier signal is part of a DMT modulated carrier signal (column 5 lines 64-67 where the carrier signal is a modulated carrier signal, column 1 lines 45-53, column 18 lines 60-65 where the signal is part of a DMT modulated signal).

9. Claims 2, 11-12, 16-17, and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sands et al. (US 6134283) in view of Hardcastle et al. (US 6178025 B1) as applied to claims 1, 10, 15 & 20 above, and further in view of Isaksson et al. (WO 9943123).

Regarding **claims 2, 11, 16 & 21**, further Isaksson et al. teaches cyclic extensions (Figure 4, page 3 line 20-column 4 line 5). As Sands et al. uses the quiet portion of the super frame for crosstalk (FIG.4), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the cyclic extension teaching by Isaksson et al. in Sands et al.'s frame where Q is the cyclic extension to help improving the suppression of side lobe, preserving the orthogonality between the received signals (page 2 lines 15-19, page 4 lines 3-4).

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Regarding claims 12, 17 & 22, further Isaksson et al. teaches cyclic extensions including a prefix appended to the beginning of the signal and a suffix appended to the end of the signal (Figure 4, page 3 line 20-column 4 line 5). As Sands et al. uses the quiet portion of the super frame for crosstalk (FIG.4), at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the cyclic extension teaching by Isaksson et al. in Sands et al.'s frame where Q is the cyclic extension to help improving the suppression of side lobe, preserving the orthogonality between the received signals (page 2 lines 15-19, page 4 lines 3-4).

Sands et al. does not explicitly specify the means and its method for applying autocorrelation to the signal, However Hardcastle et al. teaches using auto-correlation on the received signal (Fig.3 & Fig.4). As Sands et al. estimate the power/energy of the signal, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Hardcastle et al.'s correlation teaching to estimate the power of the received signal to monitor the transmission of the signal in the system in a simple and cost-effective way (column 2 lines 5-10, lines 50-60, column 3 lines 29-33).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9314.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
January 8, 2004

A handwritten signature in black ink, appearing to read "Chieh M. Fan". The signature is written in a cursive, flowing style.

**CHIEH M. FAN
PRIMARY EXAMINER**